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(54) Title: PHOTOCURABLE COMPOSITIONS CONTAINING REACTIVE PARTICLES

(57) Abstract: A photocurable composition, including (a) a photocurable monomer, e.g. a cationically curable monomer and/or a radically curable monomer; (b) reactive particles comprising a crosslinked elastomeric core, e.g. made of polysiloxane material, and a shell of reactive groups on an outer surface of the core, wherein the reactive groups comprise epoxy groups, ethylenically unsaturated groups, or hydroxy groups; and (c) an appropriate photoinitiator, e.g. a radical photoinitiator; and a cationic photoinitiator. A method of making a 3-D object from such a composition and a 3-D object made by the method are also provided. The cured composition generally has a smooth surface. The use of the reactive particles makes the composition more stable and the particles do not readily separate out.

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G03F7/00 G03F7/032 G03F7/033 G03F7/038 G03F7/075

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G03F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01 95030 A (JSR CORP ;TANABE TOYOKAZU (JP); UKACHI TAKASHI (JP); JAPAN FINE CO) 13 December 2001 (2001-12-13) page 34, line 1 - line 9; claims; examples; table 1 ---	1,2, 8-10, 15-18, 24,25, 27-29
X	WO 00 63272 A (JSR CORP ;KATO YUKITOSHI (JP); TANABE TOYOKAZU (JP); UKACHI TAKASH) 26 October 2000 (2000-10-26) page 40, line 19 -page 41, line 2; claims; examples page 41, line 13 - line 21 --- -/--	1-4, 8-10, 15-18, 20, 23-25, 27-29

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 938 026 A (JSR CORP ; JAPAN FINE COATINGS CO LTD (JP); DSM NV (NL)) 25 August 1999 (1999-08-25) paragraphs '0038!-'0047!', '0059!', '0061!', '0093!; claims; examples ----	1-4, 8, 9, 15-18, 20, 23
X	US 5 707 773 A (SWATTON DAVID WILLIAM ET AL) 13 January 1998 (1998-01-13) claims; examples ----	1, 3
X	EP 0 640 876 A (DU PONT) 1 March 1995 (1995-03-01) claims; examples ----	1, 3
A	EP 0 403 758 A (DU PONT) 27 December 1990 (1990-12-27) cited in the application claims ----	1-29
A	EP 0 393 675 A (DU PONT) 24 October 1990 (1990-10-24) page 8, line 9 - line 12 ----	1-29
A	US 5 461 088 A (SCHULTHESS ADRIAN ET AL) 24 October 1995 (1995-10-24) cited in the application the whole document ----	1-29
A	US 2001/046642 A1 (PATEL RANJANA C ET AL) 29 November 2001 (2001-11-29) cited in the application examples ----	1-29
A	US 5 476 748 A (SCHULTHESS ADRIAN ET AL) 19 December 1995 (1995-12-19) cited in the application the whole document -----	1-29

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP/04231

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0195030	A	13-12-2001	JP 2001354996 A	25-12-2001
			JP 2002060463 A	26-02-2002
			AU 7466201 A	17-12-2001
			EP 1299770 A2	09-04-2003
			WO 0195030 A2	13-12-2001
			US 2003059708 A1	27-03-2003
WO 0063272	A	26-10-2000	JP 2000302964 A	31-10-2000
			CN 1354763 T	19-06-2002
			EP 1171502 A1	16-01-2002
			WO 0063272 A1	26-10-2000
			US 2002132872 A1	19-09-2002
EP 0938026	A	25-08-1999	JP 11228610 A	24-08-1999
			JP 11240939 A	07-09-1999
			JP 11310626 A	09-11-1999
			EP 0938026 A1	25-08-1999
			US 6287745 B1	11-09-2001
			US 2002048717 A1	25-04-2002
US 5707773	A	13-01-1998	US 6210854 B1	03-04-2001
			CA 2130159 A1	28-02-1995
			DE 69402783 D1	28-05-1997
			DE 69402783 T2	25-09-1997
			EP 0640876 A1	01-03-1995
			JP 2793963 B2	03-09-1998
			JP 7084369 A	31-03-1995
EP 0640876	A	01-03-1995	US 6210854 B1	03-04-2001
			CA 2130159 A1	28-02-1995
			DE 69402783 D1	28-05-1997
			DE 69402783 T2	25-09-1997
			EP 0640876 A1	01-03-1995
			JP 2793963 B2	03-09-1998
			JP 7084369 A	31-03-1995
			US 5707773 A	13-01-1998
EP 0403758	A	27-12-1990	US 5002854 A	26-03-1991
			AU 633557 B2	04-02-1993
			AU 5376090 A	25-10-1990
			CA 2014809 A1	21-10-1990
			CN 1048935 A	30-01-1991
			DE 69020649 D1	10-08-1995
			DE 69020649 T2	11-01-1996
			EP 0403758 A2	27-12-1990
			JP 2043870 C	09-04-1996
			JP 3114733 A	15-05-1991
			JP 6061850 B	17-08-1994
EP 0393675	A	24-10-1990	US 4942066 A	17-07-1990
			AU 623247 B2	07-05-1992
			AU 5376690 A	25-10-1990
			CA 2014804 A1	21-10-1990
			CN 1048934 A	30-01-1991
			DE 69021246 D1	07-09-1995
			DE 69021246 T2	15-02-1996
			EP 0393675 A1	24-10-1990
			HK 53897 A	02-05-1997

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 93/04231

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0393675	A		JP 3015520 A	23-01-1991
			JP 6061848 B	17-08-1994
US 5461088	A	24-10-1995	AU 7149094 A	09-03-1995
			CA 2117572 A1	27-02-1995
			EP 0643329 A2	15-03-1995
			JP 7097403 A	11-04-1995
			US 5629133 A	13-05-1997
			AT 175034 T	15-01-1999
			AU 674247 B2	12-12-1996
			DE 59407524 D1	04-02-1999
			ES 2127365 T3	16-04-1999
US 2001046642	A1	29-11-2001	AU 3023301 A	20-08-2001
			CA 2398160 A1	16-08-2001
			CN 1422394 T	04-06-2003
			WO 0159524 A1	16-08-2001
			EP 1256032 A1	13-11-2002
			JP 2003522821 T	29-07-2003
US 5476748	A	19-12-1995	AT 151085 T	15-04-1997
			AU 658780 B2	27-04-1995
			AU 5252493 A	30-06-1994
			CA 2111718 A1	22-06-1994
			DE 59306034 D1	07-05-1997
			EP 0605361 A2	06-07-1994
			ES 2100513 T3	16-06-1997
			JP 3203461 B2	27-08-2001
			JP 6228413 A	16-08-1994